Section MANAGEMENT

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https://doi.org/10.30546/200310.505.2026.1043

EU Digital Paradox: GDPR as a Barrier for the Digitalization of Polish SMEs

Abstract

Poland's transition to a digital knowledge economy is still slow, especially in the predominant micro-enterprise sector, despite the country's steady economic convergence with Western standards. This study explores the "EU Digital Paradox," in which Polish small and medium-sized enterprises (SMEs) face a structural obstacle due to the simultaneous pursuit of digital acceleration and strict data restrictions under the General Data Protection Regulation (GDPR). Using secondary quantitative data from the Polish Agency for Enterprise Development (PARP, 2025) and the Digital Economy and Society Index (DESI, 2022–2024), this study adopts the Resource-Based View (RBV) of the firm and uses a descriptive analytical design. The analysis reveals that companies are forced into "defensive digitalization" and data avoidance due to prohibitive compliance expenses, which are expected to be between 40,000 and 100,000 PLN per year. The study emphasizes that although making up the great majority of the economic landscape, micro-enterprises are subject to the same compliance obligations as larger businesses due to the current legal framework's failure to separate them. The article recommends introducing GDPR regulatory sandboxes for micro-enterprises and transitioning to a vendor-based compliance model to remove these structural barriers and accelerate digital growth.

Keywords: GDPR, digitalization, SMEs, Poland, compliance costs, Resource-Based View

Introduction

Over the past decade, Poland's economic development has been characterized by consistent convergence with Western European standards. In 2004, at the time of Poland's accession to the European Union, the country's GDP per capita was 3.9 times lower than the EU average. By 2024, this disparity had decreased, with Poland's GDP per capita only 1.7 times lower than the EU average. Over this twenty-year period, the EU's average GDP per capita increased by a factor of 1.6 to 43,145 USD, while Poland's GDP per capita grew by a factor of 3.7, reaching 25,023 USD (World Bank, 2004-2024). Macroeconomic growth has been primarily driven by a dynamic sector of Small and Medium-sized Enterprises (SMEs), which serve as the foundation of the national economy. SMEs employ 6.7 million individuals, representing 65.5% of the workforce, and contribute 52.5% of the total value added, amounting to 223.8 billion euros (European Commission, 2025). Although Poland has demonstrated strong performance in traditional industrial sectors, its progress toward a digital

knowledge economy remains inconsistent. According to the Digital Economy and Society Index (DESI), Poland consistently ranks below the European Union average in the integration of digital technology by businesses (European Commission, 2022). A significant challenge in the digital transition arises from the structural composition of the Polish private sector. The sector consists predominantly of micro-enterprises rather than mid-sized firms with the capacity to employ compliance teams (MAGDZIARCZYK & WIDERA, 2024). This fragmentation creates a regulatory challenge. Under the Resource-Based View (RBV), micro-entities face pronounced resource asymmetry, as the GDPR imposes fixed compliance costs nearly identical to those of 200-employee organizations, yet micro-enterprises lack legal departments or dedicated IT security personnel. Consequently, the GDPR functions less as a trust framework and more as a "compliance trap," diverting limited budgets from digital innovation toward legal defensibility. (Chmielarz, 2024). Existing literature often treats SMEs as a homogeneous group, failing to account for the specific resource constraints of the micro-enterprises that define the Polish market (GDPR TEXT, 2018). This article addresses the gap in existing research by analysing the General Data Protection Regulation (GDPR) as a structural barrier to the digitalization of Polish small and medium-sized enterprises (SMEs). This study is limited by its reliance on secondary data sources, which do not permit firm-level causal inference, and by the absence of primary survey data from Polish micro-entrepreneurs regarding their subjective compliance experiences.

Literature Review

This study uses the Resource-Based View (RBV) of the firm to analyse the impact of GDPR. RBV posits that a firm's competitive advantage relies on tangible and intangible resources (Mazzei, 2024). Small and Medium Enterprises (SMEs) make up 99.8% of all enterprises. While SMEs are legally defined by EU Recommendation 2003/361/EC, this study focuses on the resource asymmetry inherent in these definitions rather than the administrative thresholds (PragmaGo, 2021). The General Data Protection Regulation (GDPR), formally known as Regulation (EU) 2016/679, is a European Union law governing the handling of personal data belonging to EU residents. Adopted on 14 April 2016 and effective from 25 May 2018, the GDPR regulates data processing and transfer, requires the protection of personal data both at rest and in transit, and establishes specific rights for EU residents regarding their personal information (IBM, 2023).

Recent economic literature presents a dichotomy regarding the impact of privacy regulation on firm performance. Ullagaddi (2024) argues that the GDPR has shifted the paradigm from 'data hoarding' to 'data governance,' suggesting that compliance acts as a mechanism for building consumer trust and securing long-term competitive advantage. Under this view, regulation is a value-creating asset. Conversely, Johnson (2022) identifies a fundamental tension between privacy requirements and the data economy, noting that increased data observability for business intelligence directly conflicts with data minimization principles (Johnson, 2022). Empirical evidence supports this 'regulatory burden' perspective; Blind, Niebel, and Rammer (2022) found that compliance costs actively divert capital from innovation budgets, particularly in knowledge-intensive sectors (Blind, Niebel, & Rammer, 2024). This study posits that both perspectives are correct but structurally isolated: Ullagaddi's 'Trust Capital' is accessible primarily to large enterprises with resource redundancy, whereas Johnson's 'Innovation Drain' disproportionately characterizes the micro-enterprise experience. This divergence creates the 'EU Digital Paradox' observed in the Polish market

(Ullagaddi, 2024). Ashraf (2021) emphasizes that GDPR frameworks are frequently tailored to large organizations, which results in small and medium-sized enterprises (SMEs) facing challenges in interpreting "appropriate technical measures" as outlined in Article 32 (Article 32) (Ashraf, 2021). Magdziarczyk and Widera (2024) offer empirical evidence from Poland, highlighting that 96.43% of Polish enterprises are micro-entrepreneurs. Their findings indicate that GDPR implementation is closely linked to enterprise size. Medium-sized organizations may employ dedicated IT staff, whereas micro-enterprises often require the business owner to fulfill the roles of CEO, Data Protection Officer (DPO), and IT security manager simultaneously (MAGDZIARCZYK & WIDERA, 2024). Kobis and Chmielarz further demonstrate that the awareness level of information security managers in Polish small enterprises remains insufficient and is frequently reactive instead of proactive. These findings indicate that, for Polish SMEs, the General Data Protection Regulation (GDPR) has not yet served as a catalyst for security by design. Instead, it functions primarily as a bureaucratic checklist and has not fundamentally changed risky behaviours (Kobis & Chmielarz, 2023). Omowole (2024) and Cahyono (2025) examine strategies for small and medium-sized enterprises (SMEs) to utilize Big Data, highlighting that although Big Data facilitates market analysis and customer insight, the stringent consent requirements outlined in GDPR (Article 6) hinder adoption. Among Polish SMEs, which are generally risk-averse, the complexity associated with anonymizing large datasets often results in data avoidance (Omowole, Olufemi-Phillips, Ofodile, Eyo-Udo, & Ewim, 2024) (Cahyono, Sijabat, Panjaitan, Julianingsih, & Lorenzo, 2025). Zanker and colleagues, in a comparative study of eight European countries including Poland, found that the administrative burden associated with documenting data processing activities frequently discourages SMEs from collecting data that could provide valuable business insights (Zanker, Bureš, Cierniak-Emerych, & Nehéz, 2021). VinciWorks reports on fines, such as the McDonald’s Poland case, indicate that regulatory enforcement in Poland is becoming increasingly stringent. The threat of financial penalties, which may reach up to 4% of turnover, has led to a trend of 'defensive digitalization,' in which organizations prioritize investment in legal disclaimers over enhancements to firewall infrastructure or intrusion detection systems (VINVIWORKS, 2025).

Methodology

A descriptive analytical design grounded in the Resource-Based View (RBV) is employed to assess the GDPR's structural impact on the digitalization of Polish SMEs. The RBV explains how fixed regulatory compliance costs disproportionately diminish the resources micro-enterprises need for competitive digital advantage. The analysis draws on secondary quantitative data from three institutional sources: the European Commission's Digital Economy and Society Index (DESI), benchmarking Poland against the EU average across indicators such as cloud computing, big data, and AI adoption; the Polish Agency for Enterprise Development (PARP) reports, detailing adoption trends and barriers across enterprise sizes; and Statistics Poland (GUS) data on ICT infrastructure, including broadband access and 5G coverage. The research compares infrastructure availability with business utilization rates, categorizes compliance challenges into technical, legal, organizational, and regulatory domains, and estimates direct and indirect compliance costs to quantify the "compliance tax" redirecting capital from innovation.

Digitalization Analysis of Polish SMEs

A 2023 study reported that Polish companies exhibit a moderate level of engagement in technological advancement. Approximately 67% of surveyed entrepreneurs identified specific Industry 4.0 solutions. However, only about 6% of these businesses were classified as highly digitalized, having implemented partial digitization of their operational processes. The data further indicate that 30% of businesses, regardless of size, lack the fundamental understanding required to participate actively in the fourth industrial revolution (Jankowska, Mińska-Struzik, Bartosik-Purgat, Götz, & Olejnik, 2023). Poland ranks as the fifth country in the European Union (EU) by total number of small and medium-sized enterprises (SMEs), with 2.2 million such businesses (Statista, 2024). Since 2014, the European Commission has monitored the digital progress of Member States through annual Digital Economy and Society Index (DESI) reports. Member States with larger economies or populations are expected to demonstrate strong performance to support Europe in achieving the 2030 targets (European Commission, 2022). Three primary sources provide data on Polish SMEs, particularly regarding digitalization: the Digital Economy and Society Index (DESI), the Polish Agency for Enterprise Development (PARP), and Statistics Poland (GUS). DESI offers the most detailed information, covering both general digitalization and SME-specific data, and includes comparisons with other EU countries and the EU average. PARP focuses on annual reports that present comprehensive data. GUS supplies limited data, and for 2024, 10 out of 15 indicators on enterprise ICT usage are unavailable. Table 1 presents detailed data on the digitalization status of Poland, distinguishing between the private and public sectors as reported by DESI.

Table 1. DESI: digital transformation of business indicators and digitalization of public services, comparing Poland and the European Union (EU) average

Indicator	Unit of measure	Poland	European Union (EU)	Difference
Digital Transformation of Businesses				
SMEs with at least a basic level of digital intensity	% of enterprises	69.95 %	72.91 %	- 2.96 %
Electronic information sharing	% of enterprises	33.94 %	42.09 %	- 8.15 %
Social media	% of enterprises	19.32 %	30.64 %	- 11.32 %
Big data	% of enterprises	7.74 %	13.64 %	- 5.9 %
Data analytics	% of enterprises	17.62 %	32.09 %	- 14.47 %
Cloud	% of enterprises	45.44 %	38.09 %	7.35 %
AI	% of enterprises	4.92 %	12.64 %	- 7.72 %
e-Invoices	% of enterprises	13.98 %	38.04 %	- 24.06 %
AI or Cloud or Data Analytics	% of enterprises	50.43 %	53.74 %	- 3.31 %
e-Commerce turnover	% of turnover	8.46 %	12.44 %	- 3.98 %
SMEs selling online	% of enterprises	13.88	20.13 %	- 6.25 %

		%		
SMEs selling online cross-border	% of enterprises	5.43 %	8.74 %	- 3.31 %
Digitalization of Public Services				
e-Government users	% of internet users (last 12 months)	67.94 %	74.71 %	6.77 %
Digital public services for citizens	Score (0 to 100)	70.69	82.32	- 11.63
Digital public services for businesses	Score (0 to 100)	85	86.23	- 1.23
Pre-filled Forms	Score (0 to 100)	86.80	70.98	15.82
Transparency of service delivery, design and personal data	Score (0 to 100)	73.33	69.46	3.87
User support	Score (0 to 100)	81.48	88.75	- 7.27
Mobile friendliness	Score (0 to 100)	92.72	96.13	- 3.41
Access to e-health records	Score (0 to 100	91.82	82.70	9.12

Source: (European Commission, 2022)

Poland ranks below the EU average in 11 of 12 business digitalization indicators, yet exceeds the EU in cloud adoption (45% vs. 38%) and nearly matches the EU in basic digital intensity. Infrastructure is strong: VHCN coverage (83%) surpasses the EU average (82%), broadband access reached 98.7% in 2024 (GUS, 2025), and 5G coverage stands at 89%. However, the public sector outperforms the private sector, with higher adoption of e-government, pre-filled forms, and e-health solutions relative to the EU. The core finding is a digital divide based on utilization rather than access, with Polish SMEs focusing on operational continuity rather than transformative innovation.

Ошибка! Неверная ссылка закладки. presents a recent snapshot of digitalization among Polish small and medium-sized enterprises (SMEs)

Table 2. PARP: state of the small and medium-sized enterprise (SME) sector in Poland

Technology / Metric	Enterprise Type	Adoption Rate (%)	Year	Growth / Change Trend (pp = percentage points)	Primary Barrier or Motivation
Paid Cloud Computing Services (Płatne usługi w chmurze)	Small	51.00%	2024	Data not specified	Motivation: Increasing operational efficiency, improving communication / collaboration, and flexibility.
	Medium	73.20%	2024	Data not specified	
	Large	88.40%	2024	Data not specified	
Artificial Intelligence (AI) (Sztuczna inteligencja)	Small	4.00%	2024	+1.8 pp (vs 2023)	Barrier: Lack of human resources and knowledge (1.9%), high implementation costs (1.7%).
	Medium	10.40%	2024	+3.9 pp (vs 2023)	
	Large	33.00%	2024	+8.6 pp (vs 2023)	
E-commerce Sales (Sprzedaż przez sieci komputerowe)	Small	15.90%	2023	-0.4 pp (vs 2022)	Motivation: Better adjustment of the offer to customer needs.
	Medium	22.30%	2023	+1.0 pp (vs 2022)	
	Large	42.70%	2023	-0.8 pp (vs 2022)	
Open Public Data Usage (Otwarte dane publiczne)	Small	16.40%	2023	+5.1 pp (vs 2022)	Motivation: Supporting planning processes and business decision-making.
	Medium	28.90%	2023	+5.7 pp (vs 2022)	
	Large	53.70%	2023	+2.2 pp (vs 2022)	
ICT Specialists Employed	Small	19.40%	2024	Data not specified	Constraint: Small firms rely more on

(Specjaliści ICT)	Medium	47.80%	2024	Data not specified	external providers (outsourcing).
	Large	88.10%	2024	Data not specified	

Source: Zakrzewski, Robert; Tarnawa, Anna; Orłowska, Joanna; Nieć, Melania; Skowrońska, Anna; Chaber, Paweł; Zadura, Paulina, Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce (2025), PARP, Warszawa, 2025, https://www.parp.gov.pl/

PARP report also clearly shows that small businesses see lower adoption in the critical tools than medium and large business such as cloud with 51% (-22% than medium, -37% than large), AI with 4%(-6% than medium, -29% than large), e-commerce with 16% (-6% than medium, -27% than large), open public data usage with 16% (-13% than medium, -37% than large) and ICT specialists employed with 19% (-19% than medium, -69% than large). The main reasons why small businesses perform worse than large ones are: human resources and knowledge, and high implementation costs. Without targeted intervention to lower the cost of entry and boost technical literacy, the sector risks long-term digital exclusion (PARP, 2025).

Analysis of GDPR as a Barrier

Barriers companies face in implementation GDPR

The GDPR provides only two exemptions for small companies: Article 30(5) on record-keeping and Article 37 on appointing a DPO. Article 30(5) exempts businesses with fewer than 250 employees from maintaining processing records, but only if processing is "occasional." Since virtually no digitalizing business processes data occasionally, whether e-commerce, SaaS, or digital marketing, this exemption is effectively negated for Polish SMEs (European Parliament; Council of the European Union, 2016). Similarly, DPO appointment is required only for high-risk data processing, yet SMEs adopting AI or Big Data invariably trigger this threshold, requiring costly outsourced DPOs or consultants (Pansy, 2024). Article 35 further mandates Data Protection Impact Assessments for high-risk technologies, creating additional pre-launch expenses. The financial burden is disproportionate. When measured by turnover, SME compliance costs are thousands of times higher per unit than those of global technology companies (Bieliauskaite, 2018). Article 83 fines, up to 10 million EUR (2% turnover) for administrative breaches or 20 million EUR (4% turnover) for fundamental breaches, represent existential threats for micro-enterprises. This creates a chilling effect: firms avoid data collection to minimize exposure. Empirical evidence confirms this pattern. EU firms decreased data storage by 26% post-GDPR, with manufacturing firms reducing by 40% (Walsh, 2024). European data-intensive SMEs were the most disadvantaged group in post-GDPR profit developments compared to US counterparts (Koski & Valmari, 2020), and GDPR implementation resulted in an 8.1% profit decline across affected businesses (Swabey, 2022). For Polish micro-enterprises, annual compliance maintenance costs of 40,000–100,000 PLN represent capital diverted from R&D, marketing, and hiring. This "compliance tax" renders digitalization ROI prohibitive, forcing firms toward either non-compliance or non-digitalization (Harmeling, 2025). Approximately one-third of Polish micro-entrepreneurs earn no more than the national average income after mandatory levies, with only 10% exceeding PLN 15,000 monthly.

Table 3. GDPR compliance costs and total amounts adjusted for Poland

Compliance Category	Cost Item	Estimated Annual Cost	Currency	Impact on Business Operations
Personnel	Data Protection Officer (DPO) salary	240,000 (annually) (Dpo Data Protection Officer Salaries, 2025)	PLN	High fixed cost burden for small companies
Personnel	Employee training	50 - 1,000 per employee (annually)	USD	Diversion of capital from R&D and marketing
Cybersecurity	Cybersecurity measures (Average data breach cost)	4,400,000 (one-time total)	USD	High financial risk from non-compliance
Regulatory Risk	Fines and penalties (Average)	69,119 (one-time total)	EUR	Risk of prohibitive costs for micro-enterprises
Operational Management	Managing Data Subject Access Requests (DSARs)	3,000 - 7,000 (annually)	EUR	Ongoing administrative burden
Technology	Compliance software Cookies (Usercentric tool per 1500 sessions)	7 (ongoing)	EUR	Direct operational expense; diversion of capital from growth areas
Legal & Consultancy	Legal and consultancy fees	2,500 - 6,000 (daily)	PLN	Reduction in ROI of digitalization projects
Total Compliance Cost Estimation	Overall compliance maintenance for SMEs	40,000 - 100,000 (annually)	PLN	Massive diversion of capital from R&D, marketing, or hiring; may lead to non-digitalization

Source: Harmeling, Tilman, How much does GDPR compliance really cost? Guide for 2025, Usercentric, 05.10.2025, https://usercentrics.com/knowledge-hub/cost-of-gdpr-compliance/

Cybersecurity and regulatory risks are excluded from the total estimation, as they marked as fines in the event of legal breaches. These risks impose not only financial costs but also divert managerial time and attention from core business functions such as sales, marketing, product development, and other primary growth activities.

Table 4. Scenario analysis: GDPR compliance burden by enterprise size

Scenario Profile	Annual Revenue (Est.)	Compliance Cost (Low/High)	Ratio	Resource Impact
Low-performing Micro	180,000 PLN	40,000 PLN (Low est.)	22.2%	Critical Resource Depletion: Compliance consumes ~1/4 of revenue. Innovation is financially impossible.
High-Performing Micro	1,000,000 PLN	40,000 PLN (Low est.)	4.0%	Significant Constraint: equivalent to a major tax levy; reduces net profit margins significantly.
Medium Enterprise	~43,000,000 PLN *(~€10M EU Threshold)*	100,000 PLN (High est.)	0.2%	Negligible Cost: Compliance is a minor operational expense (<1%).

Source: Author's own calculation

The scenario analysis indicates a severe resource drain for most participants in the Polish market. For 90% of micro-enterprises, the General Data Protection Regulation (GDPR) operates less as a

regulatory framework and more as a prohibitive market entry fee, amounting to 22.2% of total revenue. In contrast, medium-sized enterprises experience a compliance burden of only 0.2%, even when higher absolute compliance costs (100,000 PLN) are assumed. The findings suggest that 'Defensive Digitalization' constitutes a rational survival strategy; when compliance costs exceed 20% of revenue, firms are compelled to avoid data-intensive activities to mitigate the risk of bankruptcy.

Discussion

Poland's digital divide is rooted in utilization, not access. Despite VHCN coverage surpassing the EU average, SME adoption of advanced tools remains low. This "implementation gap" represents a rational economic response to uniform GDPR enforcement rather than technical illiteracy. The RBV framework reveals three distinct strategic behaviours. Naive Non-Compliance characterizes low-resource, low-awareness micro-enterprises that disregard mandates until penalized. Strategic Compliance describes large enterprises that leverage compliance costs as competitive barriers and convert privacy into "trust capital." Between these lies Defensive Digitalization, the dominant response among Polish micro-enterprises possessing low resources but high regulatory fear, who actively avoid data-intensive technologies. This explains why 67% of entrepreneurs recognize Industry 4.0 solutions but only 6% implement them. The chilling effect is starkest in AI adoption: 4% among small firms versus 33% in large enterprises, driven by Article 35 DPIA requirements and Article 22 restrictions on automated decision-making that function as non-tariff barriers excluding micro-enterprises from the AI economy.

Conclusion

The GDPR, while effective as a global privacy benchmark, acts as a regressive tax on the Polish micro-enterprise sector, with compliance costs consuming up to 22.2% of revenue for the most vulnerable firms. The market exhibits Defensive Digitalization, where compliance fear surpasses the perceived benefits of technology adoption. Two policy interventions are recommended. First, GDPR Regulatory Sandboxes for micro-enterprises, drawing on Fintech models, would permit experimentation with AI and Big Data within simplified compliance frameworks, mitigating Article 83 penalties while safeguarding data subject rights. Second, a transition to SaaS-Based Compliance Inheritance would shift primary regulatory responsibility from individual micro-enterprises to certified cloud service providers, allowing small firms to inherit compliant status. Absent such reforms, Poland's Digital Decade 2030 objectives remain unreachable, as the regulatory environment continues to promote data avoidance over data-driven value creation.

References

1. *Ashraf, S. (2021, March 24). GDPR Implementation Framework for SMEs. Metropolia University of Applied Sciences.*
2. *Bassetière, P. M. (2021, December 18). Relocating in Central European countries : Nearshoring and outsourcing inside the European Union through the example of Poland. Retrieved from Blue Europe: https://www.blue-europe.eu/analysis-en/short-analysis/relocating-in-central-european-countries-nearshoring-and-outsourcing-inside-the-european-union-through-the-example-of-poland/*

3. *Bieliauskaite, J. (2018, May 24). GDPR: SMEs should seize the opportunities, but authorities must prevent market distortions. Retrieved from DigitalSME: https://www.digitalsme.eu/gdpr-smes-should-seize-the-opportunities-but-authorities-must-prevent-market-distortions/*
4. *Blind, K., Niebel, C., & Rammer, C. (2024). The impact of the EU General data protection regulation on product innovation. Industry and Innovation, 31(3). doi:10.1080/13662716.2023.2271858*
5. *Bradford, A. (2020). The Brussels Effect: How the European Union Rules the World. doi:https://doi.org/10.1093/oso/9780190088583.001.0001*
6. *Brodin, m. (2019, June 4). A Framework for GDPR Compliance for Small- and Medium-Sized Enterprises. European Journal for Security Research. doi:https://doi.org/10.1007/s41125-019-00042-z*
7. *Cahyono, D., Sijabat, A., Panjaitan, M. B., Julianingsih, D., & Lorenzo, A. (2025). Challenges and Opportunities in Implementing Big Data for Small and Medium Enterprises (SMEs). Journal of Computer Science and Technology Application (CORISINTA), 2(1). doi:10.33050/corisinta.v2i1.74*
8. *Chmielarz, G. (2024). Data management in Polish SMEs in the era of AI – threats and benefits of AI-based tools. Procedia Computer Science, 246, 5439-5447.*
9. *Dpo Data Protection Officer Salaries. (2025). Retrieved from https://www.glassdoor.com/Salaries/warsaw-dpo-data-protection-officer-salary-SRCH_IL.0,6_IM1114_KO7,34.htm*
10. *European Commission. (2004, August). The Standard Cost Model. Retrieved from European Commission: https://ec.europa.eu/eurostat/documents/64157/4374310/11-STANDARD-COST-MODEL-DK-SE-NO-BE-UK-NL-2004-EN-1.pdf/e703a6d8-42b8-48c8-bdd9-572ab4484dd3*
11. *European Commission. (2018). GDPR checklist for data controllers. Retrieved from GDPR: https://gdpr.eu/checklist/*
12. *European Commission. (2022). Digital Economy and Society Index (DESI). Retrieved from DESI: https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts/desi-indicators?period=desi_2023&indicator=desi_sme_di4_gelo&breakdown=ent_sm_xfin&unit=pc_ent&country=AT,BE,BG,HR,CY,CZ,DK,EE,EU,FI,FR,DE,EL,HU,IE,IT,LV,LT,LU,MT,NL,PL,PT,RO,S*
13. *European Commission. (2024). Poland 2024 Digital Decade Country Report. European Commission. Retrieved from https://digital-strategy.ec.europa.eu/en/node/12822/printable/pdf*
14. *European Commission. (2025). 2025 SME Country Fact Sheet | Poland. Retrieved from https://webgate.ec.europa.eu/circabc-ewpp/d/d/workspace/SpacesStore/ba82fea0-c292-4940-af2c-2e3dfbf01711/download*
15. *European Commission. (2025). AI Act. Retrieved from https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai#1720699867912-1*
16. *European Parliament; Council of the European Union. (2016, May 4). General Data Protection Regulation. Retrieved from Official Journal of the European Union.*
17. *GDPR TEXT. (2018). Article 83 GDPR. General conditions for imposing administrative fines. Retrieved from https://gdpr-text.com/read/article-83/*
18. *GUS. (2025). Local Data Bank. Retrieved from https://bdl.stat.gov.pl/bdl/start*

19. Harmeling, T. (2025, November 5). How much does GDPR compliance really cost? Guide for 2025. Retrieved from Usercentric: https://usercentrics.com/knowledge-hub/cost-of-gdpr-compliance/
20. IBM. (2023). What is GDPR? Retrieved from IBM: https://www.ibm.com/products/cloud/compliance/gdpr
21. IMF. (2025). Republic of Poland. Retrieved from IMF: https://www.imf.org/en/countries/pol
22. Jankowska, B., Mińska-Struzik, E., Bartosik-Purgat, M., Götz, M., & Olejnik, I. (2023, May 04). Industry 4.0 technologies adoption: barriers and their impact on Polish companies' innovation performance. 31(5), 1029-1049. doi:10.1080/09654313.2022.2068347
23. Jasmontaitė-Zaniewicz, L., Calvi, A., Nagy, R., & Barnard-Wills, D. (2021). The GDPR made simple(r) for SMEs. Brussel: ASP editions - Academic and Scientific Publishers. doi:10.46944/9789461171092
24. Jelonek, D., & Wysłocka, E. (n.d.). Barriers to the development of cloud computing adoption and usage in SMEs in Poland. Advances in Information Science and Applications, 1, 128-133.
25. Johnson, G. (2022). Economic Research on Privacy Regulation: Lessons from the GDPR and Beyond. National Bureau of Economic Research (NBER) Working Paper Series, No. 30705.
26. Kierbiedź, D., & Dembinski, M. (2025). Investment on hold? Why Polish SMEs must not miss the digital transformation. Retrieved from british polish chamber of commerce: https://bpcc.org.pl/investment-on-hold-why-polish-smes-must-not-miss-the-digital-transformation/
27. Kobis, P., & Chmielarz, G. (2023). Awareness Level of Information Security Managers in Small Enterprises in Poland. 24th European Conference on Knowledge Management.
28. Koski, H., & Valmari, N. (2020). Short-term Impacts of the GDPR on Firm Performance. TLA Working Papers, No. 77. Retrieved from https://www.econstor.eu/bitstream/10419/237362/1/ETLA-Working-Papers-77.pdf
29. Lövgren, A., & Kalaj, L. (2024, May 31). A study on SMEs encountering the GDPR. Upsala, Sweden: Upsala Universitet. Retrieved from https://www.diva-portal.org/smash/get/diva2:1894313/FULLTEXT01.pdf#page=23.00
30. MAGDZIARCZYK, M., & WIDERA, K. (2024). Analysis of the Characteristics Conditioning the Implementation of the GDPR by Micro, Small and Medium-Sized Entrepreneurs. ANNALES UNIVERSITTIS MARIAE CURIE-SKŁODOWSKA, VOL. LVIII, 2, 79-100. doi:10.17951/h.2024.58.2.79-100
31. Mazzei, M. (2024). Resource-Based View (RBV). Retrieved from https://www.ebsco.com/research-starters/business-and-management/resource-based-view-rbv
32. Omowole, B. M., Olufemi-Phillips, A. Q., Ofodile, O. C., Eyo-Udo, N. L., & Ewim, S. E. (2024). Big data for SMEs: A review of utilisation strategies for market analysis and customer insight. International Journal of Scholarly Research in Multidisciplinary Studies, 5(2), 2961-3329. doi:10.56781/ijsrms.2024.5.2.0044
33. Pansy. (2024, December 29). GDPR For Small Businesses: A Quick Guide For 2025. Retrieved from https://sprinto.com/blog/gdpr-for-small-companies/#is-your-business-exempt-from-gdpr
34. PARP. (2025). Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce (2025). Warszawa: PARP. Retrieved from https://www.parp.gov.pl/storage/publications/pdf/ROSS_2025_skorygowany_22_07_2025.pdf#page=53.08

35. Polskie Radio. (2025, October 13). World Bank keeps Polish 2025 GDP growth forecast at 3.2%. Retrieved from Polskie Radio: https://www.polskieradio.pl/395/7786/artykul/3591812,world-bank-keeps-polish-2025-gdp-growth-forecast-at-32#:~:text=The%20World%20Bank%20has%20kept%20its%20forecast,**2027**%202.5%25%20The%20World%20Bank%20attributes%20Poland's
36. PragmaGo. (2021). SME sector in Poland. Retrieved from PragmaGo: https://pragmago.com/porada/sme-sector-in-poland/
37. Smirnova, Y., & Travieso-Morales, V. (2025, August 1). Why is GDPR compliance still so difficult? Retrieved from LSE: https://blogs.lse.ac.uk/businessreview/2025/08/01/why-is-gdpr-compliance-still-so-difficult/
38. Statista. (2024). Number of small and medium-sized enterprises (SMEs) in the non-financial business economy of the European Union in 2024, by member state. Retrieved from Statista: https://www.statista.com/statistics/558308/smes-in-europe-by-country/
39. Swabey, P. (2022, March 11). GDPR cost businesses 8% of their profits, according to a new estimate. Retrieved from https://www.techmonitor.ai/policy/privacy-and-data-protection/gdpr-cost-businesses-8-of-their-profits-according-to-a-new-estimate
40. Ullagaddi, P. (2024, Mar-Apr). GDPR: Reshaping the Landscape of Digital Transformation and Business Strategy. International Journal of Business Marketing and Management (IJBMM), 9(2), 29-35.
41. VINVIWORKS. (2025, July 22). Lessons from a GDPR fine: McDonald's Poland and the high cost of processor oversight failures. Retrieved from https://vinciworks.com/blog/lessons-from-a-gdpr-fine-mcdonalds-poland-and-the-high-cost-of-processor-oversight-failures/
42. Walsh, D. (2024, September 10). GDPR reduced firms' data and computation use. Retrieved from MIT Management Sloan School: https://mitsloan.mit.edu/ideas-made-to-matter/gdpr-reduced-firms-data-and-computation-use
43. World Bank. (2004-2024). Retrieved from World Bank Data: data.worldbank.org
44. Zanker, M., Bureš, V., Cierniak-Emerych, A., & Nehéz, M. (2021). The GDPR at the Organisational Level: A Comparative Study of Eight European Countries. E&M Economics and Management, 24(2). doi:10.15240/tul/001/2021-2-013